

WETLANDS
PROJECT SPECIFICATIONS

**SECTION 01 14 00
WORK RESTRICTIONS**

PART 1 GENERAL

1.01 ACCESS TO SITE

A. Contractor access to the Project is allowed only via East Ponce De Leon Street. Contractor is responsible for maintaining this road throughout the construction period and for restoring the road to original or better condition at the end of construction. The public road must be maintained in a condition passable by passenger cars during all weather conditions. All equipment and materials, such as stone base, needed to accomplish this maintenance and access are to be included in Contractor's bid price for the Project. Except for the access route from Wall Bridge Road, stone material shall not be used in the construction of any access route.

2.01 SPECIAL REQUIREMENTS

A.

- Construction, storage of materials and equipment, and other land disturbances are not allowed beyond the "Limits of Disturbance".
- Temporary equipment crossings of streams and all other in-stream disturbances must be coordinated with and approved by the Project Engineer in advance.
- Equipment shall be maintained to prevent fuel, oil and lubricant spills in the vicinity of the stream or wetlands. Refueling, repairs and lubrication will be performed at a safe distances from the stream and only at locations approved by the construction inspector where water is controlled by runoff control measures.
- Following project completion, the soil shall be scarified, and the haul roads stabilized with permanent seed and mulch. Damage to any existing road or vegetation shall be repaired to a condition that is at least as good as the condition before start of construction, as directed by Project Engineer. Slopes on haul roads shall be constructed to a stable angle, shaped and dressed to the satisfaction of the Project Engineer.
- This project is adjacent to private property and residences. Access is allowed only via the routes designated on plans. Work hours will be limited to daylight hours Monday through Saturday except in emergencies or with special approval of Engineer.
- Any stone or other imported material that is used for haul roads must be completely removed from the site prior to grassing. Contractor should plan on moving equipment during dry conditions or using movable mats if conditions dictate.

END OF SECTION

SECTION 01 20 00
MEASUREMENT AND PAYMENT

PART 1 – GENERAL

1.01 SCOPE OF WORK

SCOPE

- A. The word “work” as used in these Contract Documents means the furnishing of all labor, equipment, tools, materials and services necessary for constructing, installing, testing, maintenance and start-up of a complete, warranted and fully functional Project as indicated on the drawings and specified herein.
- B. The word “construct” as used in these Contract Documents means to furnish, install, perform, and provide all labor, equipment, tools, materials and services necessary for constructing, installing, testing, maintenance and start-up of a complete, warranted and fully functional Project as indicated on the drawings and specified herein.
- C. When the word “installed” is used in these Contract Documents with reference to an item or portion of work it means an item or portion of the work that has been constructed or completed by the Contractor.

1.02 MEASUREMENT AND PAYMENT

- A. The Bid Proposal lists all Bid Items for the Project. There will be no payment except for the listed Bid Items; therefore, the Contractor shall apportion his total Price for the Project among the designated Bid Items listed herein. Required items of work and incidentals necessary for the satisfactory completion of the Project which are not specifically listed as a Bid Item on the Bid Form, shall be considered as incidental to the work.
- B. Each Bid Item is described in the Specifications and/or the Contract Drawings. The cost of work elements that are not listed as Bid Items shall be included with the price of that Bid Item to which the work is incidental. All costs of such incidental work, including Contractor's overhead costs and profit, shall be considered as included in the Bid Price for the various listed Bid Items, and the Contractor shall prepare the Bid Form accordingly.
- C. Periodic payment for unit price items will be based on monthly measurements of actual work completed multiplied by the unit price. For lump sum bid items, estimates of percentage complete established by an approved schedule shall be the basis by which progress payments will be authorized. Measurements and estimates shall be submitted by the Contractor and shall be subject to approval by the Engineer. Contractor shall make certain all work has been measured before concealing.
- D. Any portion of work that, in the opinion of the Engineer, does not meet the requirements of the contract will not be considered for payment.

1.03 PAY ITEMS

1. Erosion and Sediment Control shall include any work described in Section 31 25 00 of these Specifications that is not otherwise listed as a separate Bid Item. This item shall be paid on a Lump Sum basis. The Lump Sum amount will be paid to the Contractor in equal monthly payments prorated according to the total bid item amount divided by the number of months allocated for contract completion.
2. Temporary Silt Fence constructed at the locations shown on the plans and as may be approved by Engineer will be measured in place when completed and paid for at the Unit Price bid per Linear Foot of length measured along the ground.
3. Temporary Rock Filter Dam constructed at the location shown on the plans and as may be approved by Engineer will be measured in place when completed and paid for at the Unit Price bid for Each.
4. Rock Outlet Control Structure constructed at the location shown on the plans and as may be approved by Engineer will be measured in place when completed and paid for at the Unit Price bid for Each.
5. Mass Earthwork furnished and installed in accordance with contract provisions as shown on the plans for wetland excavation and payable as Lump Sum.
6. Finished Wetland Grading furnished and installed in accordance with contract provisions as shown on the plans for final wetland grades including fine grade and edge shaping as may be approved by Engineer and paid per Lump Sum.
7. Rock Cross Vane constructed in accordance with contract provisions at the locations shown on the plans and as may be approved by Engineer will be counted in place and paid for at the Unit Price bid per Each.
8. Soil Preparation and Permanent Grass. This item will be measured in place and paid for at the unit price per Square Foot.
9. Tree/Shrub Planting furnished and installed in accordance with contract provisions at the locations shown on the plans and payable as Lump Sum

9.a Herbaceous Forbs and Sod Planting. This item furnished and installed in accordance with contract provisions at the locations shown on the plans and payable as Lump Sum
10. Survey Control. This item furnished and performed as described in Section 01 32 33 of the Specifications and payable as Lump Sum.

END OF SECTION

SECTION 01 32 23
SURVEY AND LAYOUT DATA

PART 1 GENERAL

1.01 SURVEY DATA PROVIDED TO CONTRACTOR

- A. Survey data to be provided by the Engineer includes:
- Two existing Benchmarks set in place with horizontal coordinates and vertical elevations as shown and listed on the drawing entitled “Existing Conditions”.
 - Coordinates for staking silt fence, wetland limits and elevations and cross vane locations.
 - Shop drawings as needed.

1.02 CONSTRUCTION STAKE OUT BY CONTRACTOR

A. From the information provided, the Contractor shall develop and make such additional surveys as are needed for construction, such as control lines, slope stakes, batter boards, and stakes for stream bank and in-stream structure locations and other working points, lines, and elevations. Survey work shall be performed under the supervision of a Georgia licensed registered land surveyor. The Contractor shall reestablish reference benchmarks and survey control monuments destroyed by his operations at no cost to the Owner. The Contractor shall have the full responsibility for constructing the Project to the correct horizontal alignment, as shown on the Drawings, as specified, or as directed by the Engineer. The Contractor shall assume all costs associated with rectifying work constructed in the wrong location.

END OF SECTION

SECTION 01 33 00
SUBMITTAL PROCEDURES

PART 1 GENERAL

1.01 SCHEDULE FOR SUBMITTALS

- A. Contractor shall provide to Engineer a listing of all proposed submittals, and shall submit shop drawings, product data, samples and other submittals required by the Contract Documents.
- B. Designate in the construction schedule, or in a separate coordinated schedule, the dates for submission and the dates that reviewed shop drawings, product data and samples will be needed.

1.02 PROJECT-SPECIFIC REQUIREMENTS

- A. For this Project, the following submittals and samples will be required:
1. Rock Boulders for Rock Vanes: name and address of quarry supplier for, plus technical literature stating data on size range, type, hardness, etc. of rock
 2. Tree/shrubs: name and address of nursery/supplier
 3. Live Plugs: name and address of nursery supplier
 4. Erosion and Sediment control materials: complete mfgr. technical submittal
 5. Certification of Grass Seed: seed vendor's certified statement for each grass seed mixture required, stating botanical and common name, percentage by weight, and percentages of purity, germination, and weed seed for each grass seed species.

1.03 ENGINEER'S REVIEW

- A. Engineer's review is only for general conformance with the design concept for the project and general compliance with the Contract Documents. Review by the Engineer does not relieve the Contractor of responsibility for compliance with the requirements of plans and specifications. Contractor is responsible for confirming that dimensions shown on submittals conform to project requirements, and for coordination of work by various trades. Submittals reviewed by Engineer will be marked as follows:
1. "No Exceptions Noted" - Indicates the drawings have been reviewed for conformance with the contract documents and no exceptions have been taken. Proceed with the work.
 2. "Make Corrections Noted" - Indicates the drawings have been reviewed for conformance with the contract documents and work may proceed in accordance with all comments. Re-submittal will not be required.
 3. "Revise and Resubmit" - Indicates the drawings have been reviewed for conformance with the contract documents, and work may not proceed. After items to which exceptions have been taken are corrected, Contractor shall again submit copies for review.

4. "Rejected" - Indicates the drawings have been reviewed for conformance with the contract documents and are too incomplete or in an unacceptable condition for review. A notation will be made on the shop drawings as to the exceptions taken. Drawings shall be revised and resubmitted for review before proceeding with the work.
5. "Submit Specified Item" - Indicates that one or more items in the submittal were missing or incomplete. Work may commence on any items to which no exceptions were taken; missing or incomplete items must be submitted as noted.

1.04 PRODUCT DATA

A. Preparation

1. Clearly mark each copy to identify pertinent products or models.
2. Show performance characteristics and capacities.
3. Show dimensions and clearances required.
4. Show wiring or piping diagrams and controls.

B. Manufacturer's standard schematic drawings and diagrams:

1. Modify drawings and diagrams to delete information, which is not applicable to the work.
2. Supplement standard information to provide information specifically applicable to the work.

1.05 SAMPLES

A. Samples shall be of sufficient size and quantity to clearly illustrate:

1. Functional characteristics of the product, with integrally related parts and attachment devices.
2. Full range of color, texture and pattern.

1.07 SUBMISSION REQUIREMENTS

A. Make submittals promptly in accordance with approved schedule, and in such sequence as to cause no delay in the work or in the work of any other contractor.

B. Number of submittals required:

1. Product data: Submit the number of copies that the Contractor requires, plus three which will be retained by the Engineer.
2. Samples: Submit the number stated in each specification section.

C. Submittals shall contain:

1. The date of submission and the dates of any previous submissions.
2. The project title and number.

3. Contract identification.
4. The names of:
 - a. Contractor.
 - b. Supplier.
 - c. Manufacturer
5. Identification of the product, with the specification section number.
6. Field dimensions, clearly identified as such.
7. Relation to adjacent or critical features of the work or materials.
8. Applicable standards, such as ASTM or Federal Specifications numbers.
9. Identification of deviations from contract documents.

END OF SECTION

**SECTION 01 41 00
PERMITS AND FEES**

PART 1 GENERAL

1.01 OWNER/ENGINEER RESPONSIBILITIES

- A. The following Easements, Permits and Fees will be the responsibility of the Owner and/or the Engineer:
1. 404 Permit from Corps of Engineers. Status: Pending
 2. Land Disturbance Permit from City of Clarkston ; Status: Pending

1.02 CONTRACTOR RESPONSIBILITIES

- A. The following Permits will be the responsibility of the Contractor:
1. Notice of Intent (NOI) for the Storm Water Discharge Permit. Contractor shall prepare the NOI, shall serve as the Primary Permittee and shall execute the NOI as “Operator”. The Owner shall pay the all fees required with the NOI.
 2. Notice of Termination (NOT) for the Storm Water Discharge Permit will be prepared and submitted by Contractor.
- B. Contractor shall, in a timely manner, provide Owner and Engineer with copies of all Permit forms submitted on behalf of project and a copy of all Permit approvals.

END OF SECTION

SECTION 31 00 00
EARTHWORK

PART 1 – GENERAL

- 1.01 The Contractor shall provide all equipment, labor, materials and supervision necessary for earthwork operations including clearing and grubbing, dewatering, excavating all classes of material encountered, pumping, draining and handling of water encountered in the excavations, handling, storage, transportation and disposal of all excavated and unsuitable material, construction of fills and embankments, backfilling, compacting, sheeting, shoring and bracing, preparation of subgrades, surfacing and grading, and any other incidental earthwork operations that may be necessary to properly complete the work. Unless otherwise stated herein, all earthwork shall be unclassified and considered incidental to bid pay items.
- 1.02 Promptly dispose of material from clearing, excavation and grading that is not to be re-used. In doing so, observe all applicable laws, ordinances, rules and regulations. Dispose of excavated material off site at locations secured by the Contractor and in accordance with regulations. No debris shall be deposited on any private property except by written consent of the property owner. In no case shall any material be left on the project site, shoved onto abutting private properties, or be buried in embankments or trenches on the Project.
- 1.03 Excavation and structure placement work will be done in a manner which will minimize sedimentation into nearby stream.
- 1.04 Equipment operators shall be experienced and competent in the use of the equipment to which they are assigned. They shall be expected to demonstrate a level of proficiency with the equipment which enables them to be productive in all aspects of work. Operators will be instructed by the Project Engineer as to the desired result of construction activities. Operators will be responsible for determining how best to use equipment to achieve the desired results.
- 1.05 Earth moving equipment will operate only where designated by the Project Engineer. Equipment shall be in good condition and maintained to prevent leakage of fuel, oil and lubricant in the vicinity of the stream. Refueling, repairs and lubrication will be performed at a safe distances from nearby stream and only at locations approved by the construction inspector where water is controlled by runoff control measures.

- 1.06 At work sites, where equipment will be off/on-loaded and/or operated on public roads, flagmen shall be stationed to monitor vehicular traffic. The contractor will be responsible for the implementation of these measures and any damage caused to roadway surfaces by operating equipment in an improper manner on such roads.

PART 2 - CLEARING, GRUBBING, STRIPPING, TOPSOIL STORING

- 2.01 Contractor shall remove from the project area any debris, fences, buildings, and other materials in the construction areas which, if left in place, would in the Engineer's opinion interfere with the proper performance or completion of the contemplated work, would impair its subsequent use, or would form obstructions therein. Existing trees and shrubs are to remain undisturbed to the extent possible. Do not remove existing trees, shrubs and grasses without approval of Engineer.
- 2.02 Clearing and grubbing shall not exceed the limits of disturbance shown on the drawings.
- 2.03 Topsoil shall be stripped from the upper six (6) inches where stream excavation is to occur and stored temporarily in a manner which will minimize sedimentation in the stream channel.

PART 3 – EXCAVATION, DISPOSAL

3.01 General – Wetland Earthwork

- A. Excavation and earthwork operations shall be performed in a safe and proper manner under the supervision of qualified personnel and in compliance with the requirements of OSHA Construction Standards, Part 1926, Subpart P, Excavations, Trenching, and Shoring, and Subpart O, Motor Vehicles, Mechanized Equipment, and Marine Operations.
- B. All excavated and filled areas shall be maintained by the Contractor in good condition at all times until final acceptance by the Owner. All damage caused by erosion or other construction operations shall be repaired by the Contractor using material of the same type as the damaged material.
- C. Excess material excavated from wetlands removal shall be placed on-site at the direction of the on-site Project Engineers. Excess material shall be placed and spread and stabilized with mulch and seed.

PART 5 - FINAL WETLAND GRADING

- 5.01 Upon completion of mass earthwork and as Directed by on-site Project Engineers, graded areas shall be made to blend into conformation with remaining ground surfaces. All surfaces shall be left smooth and free to drain. All areas compacted by equipment, as determined by Engineer, shall be scarified to a depth of 12-inches.

END OF SECTION

SECTION 31 25 00
EROSION AND SEDIMENT CONTROL

PART 1 – GENERAL

1.01 SCOPE

- A. This part of the work consists of providing and maintaining temporary and permanent erosion and sediment control measures. Temporary and permanent erosion and sediment controls include grassing or mulching of disturbed areas and installing structural barriers at certain locations to control erosion and sedimentation during construction.
- B. The Contractor is responsible for implementing Best Management Practices (BMP's) to minimize erosion and sedimentation during and after construction as required by the Georgia Erosion and Sedimentation Control Act of 1975, as amended, Section 402 of the Federal Clean Water Act, and applicable codes, ordinances, rules, regulations and laws of local and municipal authorities having jurisdiction.
- C. The Contractor is the discharger, operator, and primary permittee (permit holder) as used in permits, laws, rules, regulations, ordinances and other soil erosion and sediment control references.
- D. Contractor shall follow practices and standards of the Manual for Erosion and Sediment Control in Georgia.
- E. As work proceeds, areas of stream bank work that are completed will be stabilized within 24-hours of disturbance with permanent seed, mulch, and matting.
- F. All designs will conform to and all work shall be performed in accordance with the standards and specifications of the publication entitled "Manual for Erosion and Sediment Control in Georgia".
- G. Erosion and sediment control devices shall be installed and inspected prior to any earthwork on site.
- H. Erosion/sediment control devices shall be checked and maintained daily and after each storm event. Each device is to be maintained or replaced if sediment accumulation has reached to half the capacity of the device.
- I. Additional erosion control devices shall be installed if required by Habersham County.
- J. All disturbed areas to be grassed as soon as construction phases permit.
- K. Slopes to be grassed with temporary or permanent vegetation within 24-hours of completion of disturbance.

- L. Any mud tracked onto road shall be cleaned up immediately at the direction of Project Engineer or City of Clarkston inspectors.
- M. Prior to removal of silt fence, all accumulated sediment must be removed then placed and stabilized on-site at a location designated by the Project Engineer and more than 50-ft. from the top of the stream banks.

1.02 QUALITY ASSURANCE

- A. Prior to starting construction, the Contractor shall submit, for the Engineer's approval, a schedule for the proposed erosion and sediment control work.
- B. The temporary and permanent erosion and sediment control measures shown on the Drawings are minimum requirements. If additional erosion and sediment control measures are required by regulatory authorities and approved by Engineer, such will be installed by the Contractor and will be paid for according to the unit price bid for each control measure as approved by the Engineer.

PART 2 – PRODUCTS

2.01 SEDIMENT BARRIER

- A. Silt Fence: Temporary silt fence shall be Type C Alternate, AS approved by GSWCC AND GDOT.
- B. Aggregate for construction exits shall be # 4 stone (.5 to 2.0-inch nominal size).
- F. All products shall be furnished and installed in accordance with the Manual for Erosion and Sediment Control in Georgia.

2.03 ROCK FILTER DAM

- A. Description. A temporary structure installed in the two drainage ditch near their outfalls to SF Peachtree Creek.
- B. Materials. GA DOT Type 2 rip-rap (10-15 inches) and Coarse Aggregate GA DOT #3 (1-2 inches). Geotextile shall be woven such as Geotex 200ST or equivalent.
- C. Installation. Place geotextile in bottom of channel. Place rip-rap 5-ft in height, 10-ft in length and 20-ft in width filling approximately half the cross-sectional area of the ditch. Cover rip-rap with 12 inches of coarse aggregate on upstream side of for additional filtration.
- D. Stone Filter Dam shall be incorporated into Stone Outlet Control Structure at wetland drainage outfall areas as directed by Project Engineer.

2.04 MATTING W/PERMANENT SEED AND STRAW MULCH

- A. Description. Biodegradable matting shall be installed on disturbed stream banks to reduce bank erosion to hold seed and wheat straw in place.
- B. Materials. Coir fiber matting (RoLanka BioD-Mat 40® or equivalent), hardwood stakes, and live stakes (see “Planting” Specs). Equivalent coir matting shall weigh 400 g/m². Anti-Wash®/Geo-Jute® shall be woven jute mat. The following table provides an estimate of matting quantities: Stakes shall be pine wedges 12 - 24 inches in length. Straw mulch shall be clean wheat straw free of seeds, weeds or other grasses.
- C. Installation. On stream banks, biodegradable matting/blanket shall be placed to hold straw mulch, seed, and soil in place (see specs for native grass seed mix and application rates). Coir fiber matting shall be installed from the toe of the bank to the bankfull elevation or top of the bankfull bench whichever is higher. The jute matting will be installed on top of the bankfull bench and extend up the remaining slope to the top of the upper bank. Where no bankfull bench is constructed then only coir matting will be installed. The matting shall be fastened in place using hardwood stakes and keyed into the ground as shown on plans. Stakes shall be installed to no less than 1 foot deep for use on side slopes and no less than 2 feet deep at the toe of the slope and along the top edge of matting.

2.05 TEMPORARY SEEDING

Temporary seeding shall be applied to areas of soil stock pile or disturbed ground where work will not occur for more than 2 weeks. Brown top millet (*Brachiaria ramosa*) shall be sused for spring/summer applications and annual rye (*Lolium muliflorum*) shall be applied in late summer/fall applications. Either seed shall be applied at a rate of 40 lbs per acre.

PART 3 – EXECUTION

3.01 GENERAL

- A. All erosion and sediment control devices and structures shall be inspected by the Contractor after each rainfall event and maintained, repaired or supplemented as necessary to satisfy the contract requirements. Sediment ponds and barriers shall be cleaned out after buildup of sediment on a schedule that will prevent overflow of silt over the top of the barrier.
- B. After adequate permanent stabilization has been provided and accepted by the Engineer, all temporary erosion and sediment control structures and devices shall be removed.

C. Basic Guidelines for Best Management Practices:

1. Coordinate the land disturbance activities to fit the topography, soil types and site conditions.
2. Minimize the size of disturbed areas and the duration of exposure of non-vegetated areas.
3. Provide temporary or permanent stabilization to disturbed areas immediately after rough grading is complete.
4. Safely convey run-off from the site to a stable outlet to prevent flooding and damage to downstream facilities resulting from increased runoff from the site.
5. Retain sediment on-site as near as possible to the location where sediment originated.
6. Minimize encroachment upon watercourses and stream buffers.

3.02 SEDIMENT CONTROL

A. Construction Exit

1. Construction exit(s) shall be placed as shown on the Drawings and as directed by the Engineer. A construction exit shall be located at each place where construction traffic will be leaving a disturbed area and entering onto a public right-of-way, street, sidewalk or parking area.
2. Placement of Construction Exit Material: The ground surface upon which the construction exit material is to be placed shall be prepared to a smooth condition free from obstructions, depressions or debris. The geotextile fabric (Geotex 200ST or equal) shall be placed to provide a minimum number of overlaps and a minimum width of one foot of overlap at each joint. The stone shall be placed with its top elevation conforming to the surrounding roadway elevations. The stone shall be dropped no more than three feet during construction.
3. Construction Exit Maintenance: The Contractor shall regularly maintain the exit with the top dressing of stone to prevent tracking or flow of soil onto public rights-of-way and paved surfaces as directed by the Engineer.
4. Construction Exit Removal: Construction exit(s) shall be removed and properly disposed of when the disturbed area has been properly stabilized, the tracking or flow of soil onto public rights-of-way or paved surfaces has ceased and as directed by the Engineer.

B. Sediment Barriers

1. Sediment barriers shall include, but are not necessarily limited to, any device that prevents sediment from leaving the disturbed area, and shall be installed as shown on the Drawings and as directed by the Engineer.
2. Sediment barriers shall be maintained to ensure the depth of impounded sediment is no more than one-half of the original height of the barrier or as directed by the Engineer. Torn, damaged, destroyed or washed-out barriers shall be repaired, reinforced or replaced with new material and installed as shown on the Drawings and as directed by the Engineer.
3. Silt fences, hay bales and rock check dams shall not be used in any flowing stream, creek or river.
4. Rip rap shall be placed as shown on the Drawings and as directed by the Engineer. Filter fabric shall be placed under all rip rap unless shown or specified otherwise; except that, filter fabric shall not be placed under rip rap on stream or drainage ditch crossings.

C. Mulch Stabilization

1. Straw mulch stabilization shall be used for temporary stabilization on disturbed areas within the construction limits where the work schedule or sequence of work prevents prompt stabilization with a permanent stand of grass.
2. Straw mulch shall be applied uniformly by hand or mechanical means to a depth sufficient to cover the soil (approximately 1 standard bale per 50 square feet of coverage). To prevent displacement by wind and water after application, the straw mulch shall be pressed into the soil with a tracked vehicle or disk harrow.
3. Wood chip mulch stabilization may be used in any area when directed by the Engineer except any area where a permanent stand of grass is to be installed. Wood chips shall be spread uniformly to a depth of at least 3 inches.

END OF SECTION

**SECTION 32 92 00
PERMANENT GRASSING**

PART 1 GENERAL

1.01 SCOPE

A. The work covered by this section includes all labor, materials, equipment and supplies needed for the preparation, planting, mulching, watering and establishment of a growing stand of permanent grass of the varieties listed herein.

1.02 SUBMITTALS

A. Certification of Grass Seed: Submit seed vendor's certified statement for each grass seed mixture required, stating botanical and common name, percentage by weight, and percentages of purity, germination, and weed seed for each grass seed species.

1.03 DELIVERY, STORAGE, AND PROTECTION

- A. Deliver grass seed mixture in sealed containers. Seed in damaged packaging is not acceptable.
- B. Deliver fertilizer in waterproof bags showing weight, chemical analysis, and name of manufacturer.

1.04 ACCEPTANCE

- A. Establish a uniform stand of the specified grass with scattered bare spots, none of which is larger than two square foot, allowed up to a maximum of 5 % of any grassed area.
- B. It shall be the responsibility of the Contractor to repair any erosion damage to the grassed area until the date of final acceptance and to re-do the work in areas that do not meet acceptance criteria.

PART 2 PRODUCTS

2.01 SEED MIXTURE

A. The seed mixture for permanent wetland grassing where indicated on drawings shall be:

Ernst Conservation Seed- Georgia Piedmont FACW Mix
ERNMX-509

Mix General Composition (subject to change by supplier based on availability):

48.0% *Panicum anceps*, GA Ecotype (Beaked Panicgrass, GA Ecotype)
19.0% *Elymus virginicus*, AR Ecotype (Virginia Wildrye, AR Ecotype)

Permanent Grassing
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Friendship Forest Wetland
Enhancement Project

- 5.0% *Carex lupulina*, Coastal Plain NC Ecotype (Hop Sedge, Coastal Plain NC Ecotype)
- 4.0% *Juncus effusus*, 'Suther'-Piedmont NC Ecotype (Soft Rush, 'Suther'-Piedmont NC Ecotype)
- 3.5% *Eupatorium fistulosum*, AL Ecotype (Joe Pye Weed, AL Ecotype)
- 3.0% *Helenium flexuosum*, VA Ecotype (Purplehead Sneezeweed, VA Ecotype)
- 3.0% *Hibiscus moscheutos*, 'Suther'-Piedmont NC Ecotype (Crimson-eyed Rosemallow, 'Suther'-Piedmont NC Ecotype)
- 2.5% *Rhynchospora globularis*, NC Ecotype (Globe Beaksedge, NC Ecotype)
- 2.0% *Bidens aristosa*, Coastal Plain NC Ecotype (Showy Tickseed Sunflower (Bur Marigold), Coastal Plain NC Ecotype)
- 2.0% *Helenium autumnale*, FL Ecotype (Common Sneezeweed, FL Ecotype)
- 1.0% *Carex glaucescens*, NC Ecotype (Southern Waxy Sedge, NC Ecotype)
- 1.0% *Saururus cernuus*, NC Ecotype (Lizard's Tail, NC Ecotype)

PART 3 – EXECUTION

- A. Soil shall be prepared by disc or drag harrow the top 1-2" of soil.
- B. Seeding methods. Since the grassing work is a performance-based specification, the Contractor will may utilize any reasonable means and methods that result is a satisfactory result for the grassing. Two methods are allowed:
 - 1. No-Till seeding. If the soil texture and smoothness are deemed satisfactory then this method is allowed. Equipment for this method on this site should be a no-till seed drill of the size and type such as Great Plains model 606NT, 6 feet wide. No-till seeding would not require the use of mulch or watering.
 - 2. Conventional tilling and seeding. This method would require disc plowing the area to sufficiently scarify the soil. Seed would then be applied using either broadcast equipment or hydro-seeding. If broadcast equipment is used then the seed bed must be rolled to provide a firm contact between soil and seed, then covered with wheat straw mulch and watered until germination. If using row seeder or other equipment that places the seed beneath the surface and compacts the soil in one pass, then mulching and water are typically not necessary. If hydro-seeding is used then mulching and watering are typically not necessary.
- D. Maintenance. Contractor is responsible for maintaining the grassed areas until a satisfactory stand of grass is achieved. Bare spots that occur due to lack of germination, erosion or other causes shall be re-done until satisfactory results are achieved.

END OF SECTION

**SECTION 32 92 23
TREE AND SHRUB
PLANTING**

PART 1 GENERAL

1.01 SCOPE

- A. The work covered by this section includes all labor, materials, equipment and supplies needed for the planting and establishment of a growing stand of trees and shrubs of the varieties listed herein as shown on the plan drawings.

PART 2 PRODUCTS

2.01 SELECTION

- A. All plant materials to be (georgia *1) or better (georgia fancy) defined and specified according to grades and standards for nursery stock published by the department of agriculture and consumer services division of plant industry utilizing the latest updated edition.
- B. All plant material shall meet the minimal size requirement as stated on the plant list.
- C. The landscape architect reserves the right to inspect and reject plants at any time and at any location. Landscape architect will decide final approval of all plant material delivered to the project site.
- D. The landscape architect may make selection of plant material procured under this project at the place of cultivation before the contractor purchases and prepares for delivery to project site. The contractor is to retain and submit certification tags verifying type and purity of landscape material.
- E. All plants shall be of selected specimen quality. Unless otherwise noted, plants shall be exceptionally dense with a naturalistic branching character as inspected and approved by the landscape architect.
- F. Landscape contractor shall refer to planting plan and plant list for material procurement. Quantity estimates on the planting plan and plant list are for reference only.
- G. Contractor shall furnish all quantities necessary to complete the planting areas as shown on the drawing to acceptance and satisfaction at the landscape architect.
- H. The contractor shall report to the landscape architect should there be changes in the planting areas on site resulting in substantial difference in quantities and species required.
- I. Warranty: all plants shall be warranted to remain alive and healthy and in vigorously thriving condition for period of 1 year from date of final acceptance.

J. Nursery recommendations:

Baker Environmental Nursery
949 Marshall Clark Road
Hoschton, GA 30548

Growild, Inc.
7190 Hill Hughes Road
Fairview, TN 37062

Hoffman Nursery
5520 Bahama Road
Rougemont, NC 27572

North Creek Nurseries
388 North Creek Rd
Landenberg, PA 19350

Rockspring Restorations
12 Paces West Drive, nw
Atlanta, GA 30327

Woodlanders, Inc
1128 Colleton, Ave, se
Aiken, SC 29801

PART 3 EXECUTION

3.01 TREE/SHRUB PLANTING

A. The landscape contractor shall furnish all materials and perform all work in accordance with drawings, specifications and instructions provided by landscape architect.

B. Contractor shall provide all equipment as necessary to execute and complete proposed landscape / irrigation installation in a timely manner complying with the scheduled completion date.

C. Workmanship and materials shall be in strict accordance with the intentions of the specified drawings. All work performed by the contractor shall be of best quality and to the satisfaction of the landscape architect.

D. Planting plans indicate diagrammatic location only. Site adjustments of planting design and relocation of plant material installed prior to landscape architect approval shall be done without penalty or additional cost to owner.

E. Landscape contractor shall stake and/or mark all tree and plant locations at site and notify landscape architect for approval prior to plant installation.

F. Utilities: the landscape contractor shall determine location of all above grade and underground
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utilities perform work that will avoid damage to utilities. The contractor shall make good all damaged utilities at no cost to owner.

G. Drainage: contractor shall conduct percolation test in areas to be planted: notify landscape architect of any poor drainage provide supplemental pit drainage as required to ensure healthy plant materials (see specifications for details) if drainage is not sufficient notify landscape architect before installing the plants. Otherwise contractor shall be totally responsible for the guarantee and livability of the plant.

3.02 GENERAL PLANTING

A. The contractor's field supervisor shall accompany landscape architect on all plant tagging and site visits.

B. Place plants upright and turned so that the most attractive side viewed.

C. Provide 1" thick long-fiber mulch such as wheat straw (measured after watering in) at all plants and planting beds. **Do not** use hay as it contains a variety of plant matter and seeds that can potentially compound efforts at eradicating foreign and undesirable species.

D. Provide a clean sharp edging of landscape beds adjacent to lawn areas unless otherwise noted.

E. Contractor shall be responsible for "rolling" all sod that is installed (on the day the sod is installed). However, no sod shall be laid where the grade is not correct.

F. Assure that soil moisture is within the required levels prior to planting. Irrigation, if required, shall be applied at least 12 hours prior to planting to avoid planting in muddy soils.

G. Assure that soil grades in the beds are smooth and as shown on the plans.

H. Plants shall be planted in even, triangularly spaced rows, at the intervals called out for on the drawings, unless otherwise noted. The first row of annual flower plants shall be 6 inches from the bed edge unless otherwise directed.

I. Dig planting holes sufficiently large enough to insert the root system without deforming the set the top of the root system at the grade of the soil.

J. Schedule the planting to occur prior to application of the mulch. If the bed is already mulched, pull the mulch from around the hole and plant into the soil. Pull mulch back so it is not on the root ball surface.

K. Press soil to bring the root system in contact with the soil.

L. Spread any excess soil around in the spaces between plants.

M. Apply mulch to the bed being sure not to cover the tops of the plants with or the tops of the root ball with mulch.

N. Water each planting area as soon as the planting is completed. Apply additional water to keep the soil moisture at the required levels. Do not over water.

3.03 TREE PLANTING

A. Remove first 8-10" of wire basket from rootballs. If removal will result in rootball injury, cut and remove wires once in hole to allow for root expansion.

B. Mulch saucers to be 8' (min.) diameter for all trees not included w/i a mulch bed.

C. Staking and guying details shown on this sheet are for reference only. The contractor is responsible to adapt staking and guying method according to site conditions.

D. The contractor is responsible for adjusting the staking and guying periodically as necessary or as instructed by landscape architect. The contractor shall maintain plant material in an upright position at all times during the contract period.

E. Staking and guying of trees shall be for the purpose of establishment only.

Staking and guying details are not designed or engineered to withstand strong wind or windstorm conditions.

END OF SECTION

**SECTION 35 42 30
ROCK VANE**

PART 1 GENERAL

1.01 SCOPE

- A. The work covered by this section includes all labor, materials, equipment and supplies needed for constructing Rock Vanes as shown in plans and described herein.
- B. A Rock vane is primarily used for bank stabilization and in-stream habitat improvement. On one side of the channel, Rocks are placed at an angle to the stream bank, gradually inclining in elevation until they are located near the bankfull surface directly adjacent to the stream bank. Water flowing downstream is forced over these Rocks towards the middle and opposite side of the channel, effectively turning flow and scouring out a pool below.

PART 2 PRODUCTS

2.01 Boulders for Footers, Headers and Sills

- A. Boulders for Footers, Headers and Sills shall be individually selected for use in the structures, shall be relatively flat on either side in the same dimension and shall be within the size range shown below. All stone shall meet the approval of the Project Engineer. While no specific gradation for boulder stone is required, the various sizes of the stone shall be equally distributed within the required size range.

Length:	2.0 ft
Width:	1.5 ft
Height	1.0 ft

2.02 Back fill material.

- A. Backfill between the vane and shore line shall include placement of geotextile fabric, rip-rap stone, surge stone, coarse aggregate and native material excavated from the stream bed, all placed as shown on plan detail drawings.

2.04 Filter Fabric

Filter fabric shall be non-woven Mirafi N150, or equivalent.

PART 3. EXECUTION

3.01 Construction.

- A. A trench shall be dug in such a manner that the footer and header Rocks are buried beneath the bed surface elevation at least three feet on both ends. An excavator, with a bucket that includes a thumb, shall be used to place Rocks. Rocks shall be tightly sealed with no gaps between the header (1) and footer Rocks (2). Filter fabric shall be placed on the upstream side of the structure and backfilled with materials excavated on-site to

prevent the washout of sediment through Rock gaps. Filter fabric shall extend from the bottom of footer Rock to the finished grade elevation and shall be placed the entire length of the structure. A rock sill shall be installed to further prevent water flowing around the structure. The area between the stream bank and vane on the upstream side of the structure shall be backfilled with stream bed material.

Structures shall be built to the approval of the Project Engineer. Basic vane dimensions shall be based on the following:

Vane arm length: 28 ft.
Vane arm vertical: 1.4 ft.
Vane arm slope: 5%
Sill length: 6 ft.

SECTION 32 92 24
HERBACEOUS
FORBS and SOD
PLANTING

PART 1 GENERAL

1.01 SCOPE

- A. The work covered by this section includes all labor, materials, equipment and supplies needed for the planting and establishment of a growing stand of herbaceous perennial forbs and sod turf as shown on the plan drawings.

PART 2 PRODUCTS

2.01 SELECTION

- A. All plant materials to be defined and specified according to grades and standards for nursery stock published by the department of agriculture and consumer services division of plant industry utilizing the latest updated edition.
- B. All plant material shall meet the minimal size requirement as stated on the plant list.
- C. The landscape architect reserves the right to inspect and reject plants at any time and at any location. Landscape architect will decide final approval of all plant material delivered to the project site.
- D. The landscape architect may make selection of plant material procured under this project at the place of cultivation before the contractor purchases and prepares for delivery to project site. The contractor is to retain and submit certification tags verifying type and purity of landscape material.
- E. All plants shall be of selected specimen quality. Unless otherwise noted, plants shall be exceptionally dense with a naturalistic branching character as inspected and approved by the landscape architect.
- F. Landscape contractor shall refer to planting plan and plant list for material procurement. Quantity estimates on the planting plan and plant list are for reference only.
- G. Contractor shall furnish all quantities necessary to complete the planting areas as shown on the drawing to acceptance and satisfaction at the landscape architect.
- H. The contractor shall report to the landscape architect should there be changes in the planting areas on site resulting in substantial difference in quantities and species required.
- I. Nursery recommendations (forbs):

Baker Environmental Nursery
949 Marshall Clark Road

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Hoschton, GA 30548

Mellow Marsh Farms
1312 Woody Store Rd.
Siler City, NC 27344

Growild, Inc.
7190 Hill Hughes Road
Fairview, TN 37062

Goodness Grows
332 Elberton Rd,
Lexington, GA 30648

Hoffman Nursery
5520 Bahama Road
Rougemont, NC 27572

North Creek Nurseries
388 North Creek Rd
Landenberg, PA 19350

Rockspring Restorations
12 Paces West Drive, nw
Atlanta, GA 30327

Woodlanders, Inc
1128 Colleton, Ave, se
Aiken, SC 29801

PART 3 EXECUTION

3.02 HERBACEOUS FORBS AND SOD

A. The landscape contractor shall furnish all materials and perform all work in accordance with drawings, specifications and instructions provided by landscape architect.

B. Contractor shall provide all equipment as necessary to execute and complete proposed landscape / irrigation installation in a timely manner complying with the scheduled completion date.

C. Workmanship and materials shall be in strict accordance with the intentions of the specified drawings. All work performed by the contractor shall be of best quality and to the satisfaction of the landscape architect.

D. Planting plans indicate diagrammatic location only. Site adjustments of planting design and relocation of plant material installed prior to landscape architect approval shall be done without penalty or additional cost to owner.

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E. Landscape contractor shall stake and/or mark all tree and plant locations at site and notify landscape architect for approval prior to plant installation.

F. Utilities: the landscape contractor shall determine location of all above grade and underground utilities perform work that will avoid damage to utilities. The contractor shall make good all damaged utilities at no cost to owner.

G. Drainage: contractor shall conduct percolation test in areas to be planted: notify landscape architect of any poor drainage provide supplemental pit drainage as required to ensure healthy plant materials (see specifications for details) if drainage is not sufficient notify landscape architect before installing the plants. Otherwise contractor shall be totally responsible for the guarantee and livability of the plant.

H. All herbaceous planting of plugs, containers and sod shall be performed after March 15, 2018

3.03 GENERAL PLANTING

A. The contractor's field supervisor shall accompany landscape architect on all plant tagging and site visits.

B. Provide 1" thick long-fiber mulch such as wheat straw (measured after watering in) at all plants and planting beds. **Do not** use hay as it contains a variety of plant matter and seeds that can potentially compound efforts at eradicating foreign and undesirable species.

C. Provide a clean sharp edging of landscape beds adjacent to lawn areas unless otherwise noted.

D. Contractor shall be responsible for "rolling" all sod that is installed (on the day the sod is installed). However, no sod shall be laid where the grade is not correct.

E. Assure that soil moisture is within the required levels prior to planting. Irrigation, if required, shall be applied at least 12 hours prior to planting to avoid planting in muddy soils.

F. Assure that soil grades in the beds are smooth and as shown on the plans.

G. Plants shall be planted in even, triangularly spaced rows, at the intervals called out for on the drawings, unless otherwise noted.

H. Dig planting holes sufficiently large enough to insert the root system without deforming the set the top of the root system at the grade of the soil.

I. If the bed is already mulched, pull the mulch from around the hole and plant into the soil. Pull mulch back so it is not on the root ball surface.

J. Press soil to bring the root system in contact with the soil.

K. Spread any excess soil around in the spaces between plants.

L. Apply mulch to the bed being sure not to cover the tops of the plants with or the tops of the root ball with mulch.

M. Water each planting area as soon as the planting is completed. Apply additional water to keep the soil moisture at the required levels. Do not over water.

END OF SECTION

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